UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,899	07/12/2001	Paul Wolejko	SAA-0055	2016

23569	7590	06/15/2005

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EXAMINER
PEREZ DAPLE, AARON C

ART UNIT	PAPER NUMBER
2154	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/903,899	WOLEJKO ET AL.
	Examiner	Art Unit	
	Aaron C. Perez-Daple	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 February 2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>39-61</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>39-61</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *   c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This Action is in response to Amendment filed 2/7/05, which has been fully considered.

2.   Claims 39-61 are presented for examination.

3.   This Action is Final.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   **Claims 52-54, 56, 57, 59 and 60** are rejected under 35 U.S.C. 102(b) as being

anticipated by Dummermuth (US 6,073,053).

6.   Dummermuth is cited by the Examiner in a previous Office Action.

7.   As for claim 52, Dummermuth discloses a control system comprising:

an input module structured to respond to a condition by transmitting a representative

signal (optical sensor 26, Fig. 1.; col. 3, lines 27-48); and

an output module (central processor 12, I/O rack 16, Fig. 1) operably coupled to the input

module, the output module including a reflex function (I/O card 18, Fig. 2) structured to

produce a state signal (output signal 29, Figs. 1 and 3; col. 3; lines 7-14) in response to

receiving the representative signal from the input module, the output module being structured

to execute the reflex function without requiring input from a controller (col. 2, lines 19-24).

8.   As for claim 53, Dummermuth discloses the control system as defined in claim 52,

further comprising the controller operably coupled to the input module and the output

module (Figs. 1 and 2).

9.   As for claim 54, Dummermuth discloses the control system as defined in claim 53,

further comprising a configuration tool operably coupled to the output module, the

configuration tool being structured to configure the reflex function (col. 2, lines 29-38; col. 4,

lines 16-19).

10.   As for claim 56, Dummermuth discloses the control system as defined in claim 52,

wherein the reflex function is at least one of a Boolean logic function, a comparison function,

a counter function, a timer function, and an edge detection function (col. 2, lines 29-31).

11.   As for claim 57, Dummermuth discloses the control system as defined in claim 52,

wherein the output module is coupled to the input module by a network (Figs. 1 and 2).

12.   As for claim 59, Dummermuth discloses the control system as defined in claim 52,

wherein the first reflex function is specified in an object dictionary (memory 52 and 54, Fig.

2; col. 3, line 65 – col. 4, line 7).

13.   As for claim 60, Dummermuth discloses the control system as defined in claim 59,

wherein the object dictionary is embedded within a master scanner (central processor 12, Fig.

2; col. 3, line 65 – col. 4, line 7).

Claim Rejections - 35 USC § 103

14.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15.   **Claims 39-42, 44, 46, 47, 49, 50 and 55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dummermuth (US 6,073,053) (hereinafter Dummermuth) in view of McLaughlin et al. (US 5,988,847) (hereinafter McLaughlin).

16.   McLaughlin is cited by the Examiner in a previous Office Action

17.   As for claim 39, Dummermuth discloses a control system comprising:

an input module structured to respond to a condition by transmitting a representative signal (col. 3, lines 27-48; optical sensor 26, Fig. 1); and

an output module (central processor 12, I/O rack 16, Fig. 1) operably coupled to the input module, the output module including *circuitry* (I/O card 18, Fig. 2) configurable with a first reflex function at a first time and a second reflex function at a second time, the first reflex function being structured to produce a state signal (output signal 29, Figs. 1 and 3; col. 3, lines 7-14), in response to receiving the representative signal from the input module and without requiring input from a controller (col. 2, lines 29-31; col. 4, lines 16-19).

Although Dummermuth teaches programmable and configurable circuitry, Dummermuth does not explicitly disclose that the circuitry may comprise firmware. It is well-known and obvious to one of ordinary skill in the art that firmware, hardware, and software perform equivalent functions and may be substituted for each other or used in combination, as taught explicitly by McLaughlin (col. 4, line 65 – col. 5, line 8). It would have been obvious to one

of ordinary skill in the art at the time of the invention to modify McLaughlin by using

firmware in order to provide an easily programmable circuit.

18.   As for claim 40, Dummermuth discloses a control system as defined in claim 39,

wherein:

the first reflex function comprises at least one of a Boolean logic function, a comparison

function, a counter function, a timer function, and an edge detection function (col. 2, lines

29-31) and

the second reflex function comprises at least one of a Boolean logic function, a

comparison function, a counter function, a timer function, and an edge detection function,

wherein the first reflex function is different than the second reflex function (col. 2, lines 29-

31).

19.   As for claim 41, Dummermuth discloses the control system as defined in claim 39,

further comprising a computer based tool to configure the firmware with one of the first

reflex function and the second reflex function (col. 2, lines 29-38; col. 4, lines 16-19).

20.   As for claim 42, Dummermuth discloses the control system as defined in claim 39,

wherein the output module is coupled to the input module by a bus (Fig. 2; col. 3, lines 49-

51).

21.   As for claim 44, Dummermuth discloses the control system as defined in claim 39,

wherein the output module is coupled to the input module by a network (Figs. 1 and 2).

22.   As for claim 46, Dummermuth discloses the control system as defined in claim 39,

further comprising a master scanner operatively coupled to the input module and the output

module (col. 4, lines 13-16).

23.   As for claim 47, Dummermuth discloses the control system as defined in claim 39,

wherein the master scanner comprises a programmable logic controller (central processor 12,

Fig. 2).

24.   As for claim 49, Dummermuth discloses the control system as defined in claim 39,

wherein the first reflex function is specified in an object dictionary (memory 52 and 54, Fig.

2; col. 3, line 65 – col. 4, line 7).

25.   As for claim 50, Dummermuth discloses the control system as defined in claim 39,

wherein the object dictionary is embedded within a master scanner (central processor 12, Fig.

2; col. 3, line 65 – col. 4, line 7).

26.   As for claim 55, although Dummermuth teaches programmable and configurable

circuitry, Dummermuth does not explicitly disclose that the circuitry may comprise

firmware. It is well-known and obvious to one of ordinary skill in the art that firmware,

hardware, and software perform equivalent functions and may be substituted for each other

or used in combination, as taught explicitly by McLaughlin (col. 4, line 65 – col. 5, line 8). It

would have been obvious to one of ordinary skill in the art at the time of the invention to

modify McLaughlin by using firmware in order to provide an easily programmable circuit.

27.   **Claims 43, 45, 48, and 51** are rejected under 35 U.S.C. 103(a) as being obvious over

Dummermuth and McLaughlin in further view of Edwards et al (US 5,938,754) (hereinafter

Edwards).

28.   Edwards is cited by the Examiner in a previous Office Action

29.   As for claims 43 and 45 Dummermuth and McLaughlin do not specifically teach the use

of CANopen protocol. Edwards teaches the use of CANopen protocol in industrial

manufacturing applications for detection and correction of transmission errors caused by

electromagnetic interference (col. 2, lines 23-38). It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify Dummermuth and McLaughlin

by using CANopen protocol over either a network or a bus because this would provide an

easily configurable system and allow for detection and correction of transmission errors

caused by electromagnetic interference, as taught by Edwards above.

30.   As for claim 48, Dummermuth and McLaughlin do not specifically disclose a reflexive

control system wherein the master scanner is a field bus coupler. Edwards teaches the use of

a field bus and a field bus coupler in an industrial control system for easily configuring a

system and for detection and correction of transmission errors caused by electromagnetic

interference (col. 1, lines 9-22; field bus coupler is inherent for coupling with the field bus).

It would have been obvious to one of ordinary skill in the art at the time of the invention to

modify Dummermuth and McLaughlin by using a field bus coupler as the master scanner in

order to employ a CAN network because this would provide the advantages of an easily

configurable system and detection and correction of transmission errors caused by

electromagnetic interference, as taught by Edwards above.

31.   As for claim 51, Dummermuth does not specifically disclose assigning first and second

addresses to the input and output modules, respectively. Edwards teaches assigning

addresses to all devices connected to a network for use in a CANopen network which

provides the advantages of easily configuring a system and for detection and correction of

transmission errors caused by electromagnetic interference (col. 1, lines 9-22 ; field bus

coupler is inherent for coupling with the field bus). It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify Dummermuth by assigning first

and second addresses to the input and output modules, respectively, in order to employ a

CAN network which has the advantages of an easily configurable system and detection and

correction of transmission errors caused by electromagnetic interference, as taught by

Edwards.

32.   **Claims 58 and 61** are rejected under 35 U.S.C. 103(a) as being obvious over

Dummermuth in view of Edwards.

33.   As for claim 58, Dummermuth and McLaughlin do not specifically teach the use of

CANopen protocol. Edwards teaches the use of CANopen protocol in industrial

manufacturing applications for detection and correction of transmission errors caused by

electromagnetic interference (col. 2, lines 23-38). It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify Dummermuth and McLaughlin

by using CANopen protocol over either a network or a bus because this would provide an

easily configurable system and allow for detection and correction of transmission errors

caused by electromagnetic interference, as taught by Edwards above.

34.   As for claim 61, Dummermuth does not specifically disclose assigning first and second

addresses to the input and output modules, respectively. Edwards teaches assigning

addresses to all devices connected to a network for use in a CANopen network which

provides the advantages of easily configuring a system and for detection and correction of

transmission errors caused by electromagnetic interference (col. 1, lines 9-22 ; field bus

coupler is inherent for coupling with the field bus). It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify Dummermuth by assigning first

and second addresses to the input and output modules, respectively, in order to employ a

CAN network which has the advantages of an easily configurable system and detection and

correction of transmission errors caused by electromagnetic interference, as taught by

Edwards.

Response to Arguments

102 Claim Rejections

35.   Applicant's arguments filed 2/7/05 have been fully considered but they are not

persuasive.

Applicant asserts that Dummermuth does not disclose an output module which performs

a reflex function without requiring input from a controller. More specifically, Applicant

asserts that the enable signal from the central processor to the reflex function circuitry of

Dummermuth (col. 2, lines 11-15) is such an input, and that therefore Dummermuth does not

anticipate this limitation of the claims. The Examiner respectfully disagrees. As recited in

claim 52, output module merely *includes* a reflex function. Therefore, the output module

may reasonably be interpreted as comprising additional features, such as the central

processor 12 and I/O rack 16 of Dummermuth. Since these features are interpreted as part of

the output module, the *output module* does not receive an *input* signal from a controller. That

is, a signal which is *internal* to the module cannot reasonably be interpreted as an *input*.

In order to overcome the Dummermuth reference as applied under 35 USC 102(b), the

Examiner suggests amending the claims to particularly recite that the circuitry (or firmware)

for performing the reflex function does not require an enablement signal from a controller

(e.g. the reflex function is *always* enabled). Alternatively, the Applicant could explicitly

recite the controller as an additional feature of the invention (e.g. the invention would

comprise an input module, an output module, and a controller), thereby preventing the

Examiner from interpreting the central processor as part of the output module.

Therefore, the 102 rejection of claims 39-42, 44, 46, 47, 49, 50 and 55 is proper.

103 Claim Rejections

36.   Applicant's arguments filed 2/7/05 have been fully considered but they are not

persuasive.

Applicant again asserts that Dummermuth does not disclose an output module which

performs a reflex function without requiring input from a controller. The Examiner

respectfully disagrees for the same reasons given above. Specifically, the claims do not

particularly recite that the *firmware* does not require an enablement signal from a controller.

Moreover, even if the claims did particularly recite that the firmware does not receive an

enablement signal from a controller, the Examiner finds that this modification would have

been obvious to one of ordinary skill in the art at the time of the invention. In particular, the

enablement signal acts only as additional safety measure against inadvertently activating the

reflex function. This signal is not central to the concept of the invention, and the invention

could easily be configured to function without it, as would have been obvious to one of

ordinary skill in the art. Such a modification would have been made, for example, when a

reflex function controlled a key safety feature of the machinery, thereby making the

performance of the reflex function more important than the functioning of the controller.

Therefore, even assuming without admitting that this limitation of the claims were not taught

by Dummermuth, it would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Dummermuth by not requiring an enablement signal from a

controller for the purpose of ensuring the safety of the machinery for critical functions.

Applicant further asserts that the Examiner failed to provide proper motivation for the

combination of Dummermuth and McLaughlin. The Examiner respectfully disagrees.

McLaughlin is cited for the explicit teaching that hardware, software, and firmware are

interchangeable equivalents, as understood by one of ordinary skill in the control arts. As

further understood by one of ordinary skill in the art, firmware provides an advantage over

hardware in that it can be easily programmed and configured. McLaughlin is not required to

expressly state this benefit, because it is already understood by one of ordinary skill in the art

and therefore implied by the McLaughlin reference. See MPEP 2144. Therefore, the

Examiner has provided sufficient motivation for combination of the references, and the 103

rejection is proper.

Conclusion

37.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until

after the end of the THREE-MONTH shortened statutory period, then the shortened statutory

period will expire on the date the advisory action is mailed, and any extension fee pursuant to

37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

38.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron C. Perez-Daple whose telephone number is (571) 272-3974. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571) 272-3964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/3/05

Aaron Perez-Daple

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